Department of Agriculture

nt Health Inspection Service

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Heartwater:

A Tick-Borne Disease of Ruminants

Heartwater

A Tick-Borne Disease of Ruminants

Heartwater is an infectious, noncontagious, tick-borne disease of domestic and wild ruminants, including cattle, sheep, goats, antelope, and buffalo. The disease is caused by an intracellular rickettsial parasite, *Cowdria ruminantium*, and is transmitted primarily via the tropical bont tick *(Amblyomma variegatum)* or other ticks in the genus *Amblyomma*.

Heartwater is commonly transmitted by the tropical bont tick, *Amblyomma variegatum*. The tick is about 1/8–1/4 inch long before feeding but can grow as large as 1/2–3/4 inch long after feeding on an animal.

The livestock owner should inspect all animals on the premises for tick infestation and report clinical signs that suggest heartwater to a veterinarian or State or Federal animal health official.

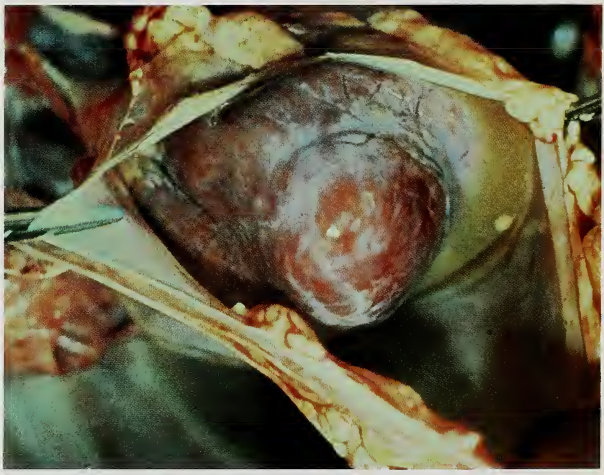
Heartwater is usually an acute disease and is commonly fatal within a week of onset of clinical signs. The disease is widespread in most of Africa and on several islands in the West Indies. With increased trade and movement of animals in today's global market, heartwater may present a significant threat to the domestic livestock industry in the United States.

Livestock owners should monitor their animals for signs of heartwater. If heartwater is suspected, owners should immediately report these findings to a veterinarian or to a State or Federal animal health official.

History

Heartwater was first identified in sheep in South Africa in the 1830's. By 1898, it was shown to be a transmittable disease, and in 1900, the tropical bont tick was identified as a vector. In 1980, heartwater was reported for the first time in the Western Hemisphere on the Caribbean island of Guadeloupe, although the vector tick was probably introduced from Africa much earlier. The disease is also present on the Caribbean islands of Marie Galante and Antigua. The tropical bont tick has spread to several other islands in the Caribbean, although a definitive diagnosis of heartwater has not been made to date on those islands.

The terminal stages of heartwater. Prior to death, the animal may convulse and fall, discharging frothy material from its nostrils and mouth.



Fluid in the thin, membranous sac surrounding the heart is a common postmortem finding in an animal infected with heartwater.

Signs

The acute form of heartwater is the most commonly observed presentation of the disease. A sudden high fever (107 °F) is followed by loss of appetite, depression, and respiratory problems. Animals may initially have an increased respiratory rate, followed within a few days by severe respiratory distress. Nervous disorders often follow the respiratory signs and can include a variety of abnormal behaviors such as excessive chewing movements, incoordination, star-gazing, head tilt, overly rigid posture, and walking with a high-stepping gait. Some animals may undergo convulsions or be unable to rise. These nervous signs usually last for no more than 24 to 48 hours, followed by the animal's death. In some cases, the nervous signs may not be noticed prior to death.

A mild form of the disease, known as "heartwater fever," is present in some affected regions among indigenous breeds with a natural or acquired resistance to heartwater. The only clinical sign of the mild form of the disease is a transient fever, and animals with this form usually recover.

Postmortem Lesions

Heartwater derives its name from a common postmortem finding of excessive fluid in the sac surrounding the heart. More commonly, the fluid accumulates within the lungs, thus the lungs appear "wet" and heavy. The fluid may also accumulate within the chest cavity itself, outside the lungs.

Confusion With Other Diseases

The observed nervous system abnormalities suggest other diseases (such as rabies, tetanus, meningitis, or encephalitis) or toxic poisoning.

A definitive diagnosis of heartwater is made by microscopic examination and observation of the causative rickettsia in a brain tissue smear.

How It Spreads

Heartwater is transmitted only by ticks of the genus *Amblyomma*, with the tropical bont tick the most important vector. This tick is widely distributed throughout Africa, Yemen, the Cape Verde islands, and several islands in the Caribbean.

The life cycle of *Amblyomma* ticks may take from 5 months to 4 years to complete. Thus, the infection may persist in the environment, inside the tick, for a long time. The immature stages of the tick will feed on a wide variety

of livestock, wild ungulates, groundbirds, small mammals, reptiles, and amphibians.

Rapid spread of the tropical bont tick in the West Indies has occurred since the 1960's. Movement of tick-infested livestock was incriminated in some cases, but overall, the cause of the spread of heartwater has not been determined.

Cattle egrets became established in the region in the 1950's and have been implicated in much of the recent spread of heartwater. Small numbers of tick-infested cattle egrets have been shown to move among islands in the region, but these birds are not considered to be efficient disseminators of the tick.

Susceptible Species

Animals susceptible to heartwater include domestic cattle, sheep, goats, and buffalo. Some breeds of cattle (e.g., Jerseys and Brahmas) may be more susceptible than others. Exotic ruminants can also contract the disease.

In laboratory tests in the United States, the white-tailed deer *(Odocoileus virginianus)* has been shown experimentally to be highly susceptible to heartwater. *Amblyomma maculatum*, another potential vector, is a common parasite of white-tailed deer in the Southern United States. However, there is no evidence that heartwater is present in wildlife in this country.

Prevention and Control

Preventive measures by the livestock owner should include implementation of an effective tick-control program, including regular inspection of animals and pastures for ticks and elimination of the vector through acaricides.

To prevent introduction of heartwater or any other foreign animal disease, the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) tests imported animals for heartwater and other diseases and ensures that all animals are free of ticks or other potential insect vectors before entry into the United States is permitted.

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What Can the U.S. Livestock Owner Do?

Livestock owners should monitor their animals regularly for clinical signs of heartwater or tick infestation. If heartwater is suspected, a veterinarian, State or Federal animal health official, or county agricultural agent should be contacted at once.

The livestock owner is an essential link in the cooperative effort to protect our Nation's livestock resources from costly and deadly foreign animal diseases. Both early recognition of disease signs and prompt notification of animal health officials are essential if prevention or eradication of these diseases is to be successful.

For further information on heartwater disease, you may contact:

USDA-APHIS-Veterinary Services
Emergency Programs
P.O. Box 96464
Washington, DC 20090-6464
or telephone that office at (301) 436-8073.